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September 1970

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METEOROLOGICAL DATA REPORT

NIKE-HYDAC STV 96  
(28 August 1970)

BY

LEN E. CARTER

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ATMOSPHERIC SCIENCES LABORATORY  
WHITE SANDS MISSILE RANGE, NEW MEXICO

ECOM

UNITED STATES ARMY ELECTRONICS COMMAND

METEOROLOGICAL DATA REPORT

NIKE-HYDAC STV 96  
(28 August 1970)

By

Len E. Carter

DR-559

September 1970

DA Task 1T665702D127-02

ATMOSPHERIC SCIENCES LABORATORY  
WHITE SANDS MISSILE RANGE, NEW MEXICO

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# ABSTRACT

Meteorological data gathered for the launching of Nike-Hydrac STV 96 are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.

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## INTRODUCTION

Nike-Hydac STV 96 was launched from Launch Complex 33, L-361, White Sands Missile Range (WSMR), New Mexico, at 2200 hours MDT, 28 August 1970.

Meteorological data used in conjunction with theoretical calculations to predict rocket impact were collected by the Meteorological Support Technical Area, Atmospheric Sciences Laboratory (ASL), WSMR, New Mexico. Ballistics Meteorologists for this firing were George M. Fugate and Len E. Carter.

## DISCUSSION

Wind data for the first 216 feet above the surface were obtained from a system composed of 5 aerovanes mounted on a 200-foot tower and cabled to component wind indicators.

From 216 to 4,000 feet above the surface, wind data were obtained from double-theodolite-observed balloon ascents.

Temperature, pressure, and humidity data, along with upper wind data from 4,000 to 100,000 feet above the surface, were obtained from standard rawinsonde observations.

Mean wind component values in each ballistic zone were determined from vertical cross sections by the equal-area method.

Theoretical rocket performance values and wind-weighting values as a function of altitude were provided by the Atmospheric Sciences Laboratory (ASL) and are the basis for the data appearing in Table I.

#### REFERENCES

1. Jacobs, W. N., May 1968: "Automatic pibal tracking system." Rep. No. ECOM-5196, U. S. Army Electronics Command, Atmospheric Sciences Laboratory, White Sands Missile Range, N. Mex. (AD 674 180)
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3. Walter, E. L., June 1962: "Six-variable ballistic model for a rocket." Rep. No. MM-445, U. S. Army Signal Missile Support Agency, Missile Meteorology Division, White Sands Missile Range, N. Mex.
4. Seagraves, M. A., B. Butler, September 1968: "Performance characteristics and wind effects for the Aerobee 150 with VAM booster." Rep. No. ECOM-5209, U. S. Army Electronics Command, Atmospheric Sciences Research Office, White Sands Missile Range, N. Mex. (AD 680 175)

PAYLOAD	285	Pounds
CORIOLIS DISPLACEMENT	WEST 3.1	Miles
SECOND-STAGE IGNITION	TIME 13	Seconds
	ALTITUDE 25,800	Feet MSL
PEAK	TIME 206	Seconds
	ALTITUDE 579,051	Feet MSL
UNIT WIND EFFECT	RANGE 1.78	Miles/MPH
	CROSS 1.84	Miles/MPH
TOWER TILT EFFECT	10.34	Miles/Degree

TABLE I. THEORETICAL ROCKET PERFORMANCE VALUES  
NIKE-HYDAC STV 96



LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
9- 68	.162
68- 108	.079
108- 148	.051
148- 184	.048
184- 216	.035
216- 300	.074
300- 400	.065
400- 600	.084
600- 800	.055
800-1000	.040

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
1000- 1400	.060
1400- 2000	.054
2000- 2500	.031
2500- 3000	.015
3000- 3500	.013
3500- 4270	.003
4270- 6000	-.005
6000- 11000	-.013
11000- 16000	-.012
16000- 22200	-.016

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
22200-24000	.041
24000-26000	.031
26000-31000	.047
31000-36000	.026
36000-41000	.016
41000-46000	.011
46000-53200	.005

TABLE II. BALLISTIC FACTORS  
NIKE-HYDAC STV 96

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR											
	1 2000 MDT		2 2030 MDT		3 2100 MDT		4 2110 MDT		5 2120 MDT		6 2130 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
160-200	8 QS	1.0E	2.0S	2.0W	2.0S	3.0W	3.0S	2.0W	3.0S	0.0	0.0	1.0W
200-250	8.0	1.0	3.0	1.0E	2.0	2.0	4.0	0.0	4.0	2.0E	3.0	0.0
250-350	8.0	2.0	6.0	2.0	3.0	2.0	6.0	0.0	7.0	2.0	4.0	0.0
350-450	8.0	2.0	8.0	3.0	5.0	2.0	7.0	1.0W	1.0	0.0	6.0	2.0W
450-550	8.0	2.0	9.0	4.0	6.0	2.0	8.0	0.0	8.0	0.0	6.0	1.0

TABLE 111 TOWER WIND DATA  
NIKE-HYDAC STV 96

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS MILES PER HOUR					
	7		8		9	
	2140 MDT		2150 MDT		2200 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W
160-200	2.0S	2.0W	0.0	1.0W	4.0S	1.0E
200-250	3.0	0.0	4.0S	0.0	4.0	0.0
250-350	2.0	0.0	5.0	0.0	4.0	0.0
350-450	6.0	3.0W	4.0	2.0W	2.0	2.0W
450-550	7.0	2.0	2.0	2.0	2.0	2.0

TABLE III. TOWER WIND DATA (CONT)  
NIKE-HYDAC STV 96

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR											
	1 2000 MDT		2 2030 MDT		3 2100 MDT		4 2110 MDT		5 2120 MDT		6 2130 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	7.0S	3.5E	7.0S	3.5E	5.5S	1.5W	7.5S	0.5E	7.5S	0.0	6.0S	1.0W
300- 400	6.0	7.5	7.0	4.0	6.5	0.5	7.0	0.5W	6.0	1.5W	5.5	2.0
400- 600	8.5	3.5	11.0	4.0	9.0	0.5	9.0	3.5	7.0	3.0	8.0	3.0
600- 800	10.0	3.0	12.0	4.0	11.5	2.5	11.0	3.5	10.0	2.0	9.5	3.0
800-1000	9.5	5.0	10.5	5.0	10.5	4.0	10.5	2.5	10.0	1.5	9.5	2.0
1000-1400	11.0	5.5	11.0	6.0	11.5	2.5	11.5	0.5	10.5	0.5	10.0	1.5
1400-2000	10.0	4.0	12.0	7.5	11.0	1.0	11.0	2.0E	11.5	1.0E	9.0	0.0
2000-2500	10.5	4.0	11.5	6.5	12.0	2.0E	11.0	3.0	11.5	2.5	10.0	3.5E
2500-3000	9.5	5.5	11.5	6.0	11.0	3.0	11.0	5.0	11.0	4.5	11.0	5.5
3000-3500	10.0	4.0	12.0	7.0	10.0	3.0	10.0	5.5	10.0	5.0	10.0	6.0
3500-4000	10.0	4.0	11.0	6.0	10.0	3.0	9.5	6.0	9.5	5.0	10.5	6.0

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA  
NIKE-HYDAC STV 96

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS MILES PER HOUR					
	7		8		9	
	2140 MDT		2150 MDT		2200 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	6.5S	3.5W	2.5S	2.5W	1.0S	1.0W
300- 400	4.0	4.5	3.0	4.5	1.5	1.5
400- 600	6.0	4.0	4.5	4.0	3.5	2.0
600- 800	8.0	4.0	6.0	2.5	7.5	1.0
800-1000	9.5	3.0	8.5	3.0	9.0	1.5
1000-1400	9.0	2.0	8.0	3.0	8.5	2.0
1400-2000	10.0	1.5	10.0	0.0	9.5	1.5E
2000-2500	10.0	2.0E	10.0	2.5E	10.5	3.0
2500-3000	11.0	3.5	10.5	5.0	12.0	5.5
3000-3500	11.0	4.5	8.5	6.0	12.0	7.0
3500-4000	11.5	6.0	10.0	6.0	12.0	6.0

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA (CONT)  
NIKE-HYDAC STV 96

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN KNOTS			
	1900 MDT		2200 MDT	
	N-S	E-W	N-S	E-W
4270-6000	7.0S	6.0E	7.0S	4.0E
6000-11000	0.0	12.0	0.0	11.0
11000-16000	2.0S	2.5	0.0	7.0
16000-22200	1.5	9.0	2.5S	7.0
22200-24000	1.0N	7.0	2.5N	8.0
24000-26000	4.5	4.0	5.0	6.0
26000-31000	11.0	6.5	12.0	7.0
31000-36000	15.5	9.0	13.5	15.5
36000-41000	19.5	7.0	17.5	14.5
41000-46000	14.0	2.5	16.0	6.0
46000-53200	2.0	12.0	5.0S	3.5

TABLE V RAWINSONDE-MEASURED WIND DATA  
NIKE-HY AC STV 96

STATION ALTITUDE 28 AUG. 70  
 ASCENSION NO. 74

1900 HRS NDT

SIGNIFICANT LEVEL DATA  
 2400020769  
 WHITE SANDS

WSTM SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE VI

PRESSURE MILLIBARS	DELMETRIC ALTITUDE MSL FEET	TEMPERATURE		REL. HUM. PERCENT
		AIR DEGREES	DEWPOINT CENTIGRADE	
877.1	3989.0	31.8	2.9	16.0
637.0	12994.8	6.1	-12.5	25.0
603.0	14467.7	5.0	-20.4	14.0
509.0	18950.3	-2.1	-26.1	14.0
440.0	22655.6	-10.5	-30.9	17.0
310.0	31215.0	-30.9	-44.6	25.0
277.0	33805.7	-38.0	-46.1	43.0
261.0	35147.1	-40.8	-50.2	36.0
184.0	42708.8	-57.0		
141.0	48115.6	-68.4		
130.0	49712.7	-70.7		
115.0	52092.3	-73.7		
110.0	52956.5	-70.1		
97.0	55422.1	-70.4		
87.0	57585.5	-64.4		
68.0	62578.7	-62.6		
59.0	65504.4	-57.5		
35.0	76442.9	-55.7		
30.0	79717.9	-51.8		
21.0	87377.3	-51.1		
9.5	104781.6	-42.5		
6.8	112346.1	-37.8		

STATION ALTITUDE 3989.00 FT MSL

28 AUG. 70

ASCENSION NO. 769

UPPER AIR DATA

2400020769

WHITE SANDS

WSTM SITE COORDINATES

488580.00 FEET E

185045.00 FEET N

TABLE VII

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			DIRECTION DEGREES(TN)	SPEED KNOTS			
3989.0	877.1	31.8	2.9	16.0	998.9	681.1	180.0	4.1	1.000253	
4000.0	876.8	31.8	2.9	16.0	998.6	681.0	179.9	4.1XX	1.000253	
4500.0	861.3	30.3	2.2	16.5	985.7	679.4	174.5	4.4XX	1.000249	
5000.0	846.2	28.9	1.5	17.0	973.1	677.8	169.0	4.7XX	1.000245	
5500.0	831.3	27.5	0.7	17.5	960.6	676.1	163.6	5.0XX	1.000241	
6000.0	816.6	26.1	-0.1	18.0	948.3	674.5	158.2	5.3XX	1.000237	
6500.0	802.3	24.6	-0.9	18.5	936.1	672.8	152.7	5.6XX	1.000233	
7000.0	788.1	23.2	-1.7	19.0	924.2	671.2	147.3	5.9XX	1.000229	
7500.0	774.3	21.8	-2.5	19.5	912.4	669.5	141.9	6.2XX	1.000225	
8000.0	760.6	20.4	-3.3	20.0	900.8	667.9	136.5	6.5XX	1.000222	
8500.0	747.3	18.9	-4.2	20.5	889.4	666.2	131.0	6.8XX	1.000218	
9000.0	734.1	17.5	-5.1	21.0	878.1	664.5	125.6	7.1XX	1.000214	
9500.0	721.2	16.1	-6.0	21.5	867.0	662.9	120.2	7.4XX	1.000211	
10000.0	708.5	14.6	-6.8	22.0	856.0	661.2	114.7	7.7XX	1.000207	
10500.0	696.0	13.2	-7.8	22.5	845.3	659.5	109.3	8.0XX	1.000204	
11000.0	683.8	11.8	-8.7	23.0	834.6	657.9	103.9	8.3XX	1.000201	
11500.0	671.7	10.4	-9.6	23.5	824.1	656.2	98.5	8.6XX	1.000198	
12000.0	659.9	8.9	-10.6	24.0	813.8	654.5	93.0	8.9XX	1.000194	
12500.0	648.3	7.5	-11.5	24.5	803.6	652.8	87.6	9.2XX	1.000191	
13000.0	636.9	6.1	-12.5	25.0	793.5	651.1	82.2	9.5XX	1.000188	
13500.0	625.1	5.7	-14.8	21.2	780.1	650.6	76.8	9.8XX	1.000183	
14000.0	613.6	5.3	-17.5	17.5	766.9	650.1	71.3	10.2XX	1.000178	
14500.0	602.3	4.9	-20.4	14.0	754.0	649.6	65.9	10.5XX	1.000174	
15000.0	591.0	4.2	-21.0	14.0	742.0	648.7	61.9	9.2	1.000171	
15500.0	579.9	3.4	-21.7	14.0	730.2	647.7	74.0	7.6	1.000168	
16000.0	569.1	2.6	-22.3	14.0	718.6	646.8	81.7	6.2	1.000165	
16500.0	558.4	1.8	-23.0	14.0	707.2	645.8	94.8	5.1	1.000162	
17000.0	547.9	1.0	-23.6	14.0	696.0	644.9	112.4	4.5	1.000160	
17500.0	537.7	0.2	-24.2	14.0	684.9	644.0	122.0	4.1	1.000157	
18000.0	527.6	-0.6	-24.9	14.0	674.1	643.0	130.3	3.7	1.000154	

XX WIND DATA MAY BE INVALID DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.



UPPER AIR DATA  
24000020769  
WHITE SANDS

STATION ALTITUDE 3585  
28 AUG. 70 1900 HRS MDT  
ASCENSION NO. 105

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
18500.0	517.7	-1.4	14.0	663.4	642.1	138.5	3.3	1.000152
19000.0	508.0	-2.2	14.0	652.9	641.1	146.7	3.0	1.000149
19500.0	498.2	-3.3	14.4	643.0	639.8	157.2	2.5	1.000147
20000.0	488.6	-4.5	14.8	633.3	638.4	175.0	2.0	1.000144
20500.0	479.2	-5.6	15.2	623.7	637.1	180.1	1.7	1.000142
21000.0	470.0	-6.7	15.6	614.3	635.7	166.2	2.1	1.000140
21500.0	460.9	-7.8	16.0	605.0	634.4	134.2	4.3	1.000138
22000.0	452.1	-8.9	16.4	595.9	633.1	123.1	6.1	1.000135
22500.0	443.4	-10.1	16.8	586.9	631.7	114.0	7.5	1.000133
23000.0	434.5	-11.2	17.3	577.8	630.3	105.2	8.6	1.000131
23500.0	425.7	-12.4	17.8	568.7	628.8	98.3	9.1	1.000129
24000.0	417.0	-13.6	18.2	559.7	627.4	92.6	9.7	1.000127
24500.0	408.5	-14.8	18.7	550.8	625.9	89.1	10.4	1.000125
25000.0	400.2	-16.0	19.2	542.1	624.5	87.3	10.3	1.000123
25500.0	392.1	-17.2	19.6	533.6	623.0	86.2	9.9	1.000121
26000.0	384.1	-18.4	20.1	525.2	621.6	83.3	9.0	1.000119
26500.0	376.3	-19.6	20.6	517.0	620.1	79.5	8.1	1.000117
27000.0	368.6	-20.8	21.0	508.9	618.6	73.9	7.1	1.000115
27500.0	361.1	-22.0	21.5	500.9	617.1	66.5	6.6	1.000113
28000.0	353.8	-23.2	22.0	493.1	615.7	58.0	6.4	1.000111
28500.0	346.6	-24.4	22.5	485.4	614.2	49.6	5.4	1.000109
29000.0	339.6	-25.6	22.9	477.8	612.7	41.3	4.6	1.000107
29500.0	332.6	-26.8	23.4	470.4	611.2	33.9	5.2	1.000106
30000.0	325.9	-28.0	23.9	463.1	609.7	28.2	5.8	1.000104
30500.0	319.2	-29.2	24.3	455.9	608.2	26.9	6.5	1.000102
31000.0	312.8	-30.4	24.8	448.8	606.7	27.1	7.7	1.000101
31500.0	306.2	-31.7	27.0	441.7	605.1	29.9	9.9	1.000099
32000.0	299.6	-33.1	30.5	434.7	603.4	30.5	11.5	1.000098
32500.0	293.2	-34.4	33.9	427.8	601.7	28.6	12.6	1.000096
33000.0	286.9	-35.8	37.4	421.0	599.9	28.3	13.7	1.000094

UPPER AIR DATA  
2400020769  
WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

STATION ALTITUDE 3589.0 FT MSL  
28 AUG. 70 1900 HRS MDT  
ASCENSION NO. 769

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
33500.0	280.7	-37.2	40.9	414.4	598.2	29.0	14.8	1.000093
34000.0	274.6	-38.4	42.0	407.6	596.6	29.1	15.0	1.000091
34500.0	268.6	-39.4	39.4	400.4	595.3	28.9	14.8	1.000090
35000.0	262.7	-40.5	36.8	393.4	594.0	30.1	14.4	1.000088
35500.0	256.8	-41.6	34.3**	386.3	592.6	31.5	13.9	1.000086
36000.0	250.9	-42.6	31.9**	379.2	591.2	31.7	14.3	1.000085
36500.0	245.2	-43.7	29.6**	372.3	589.8	31.7	14.8	1.000083
37000.0	239.6	-44.8	27.2**	365.5	588.5	31.1	15.6	1.000082
37500.0	234.1	-45.8	24.8**	358.8	587.1	30.6	16.6	1.000080
38000.0	228.7	-46.9	22.4**	352.3	585.7	30.3	17.8	1.000079
38500.0	223.5	-48.0	20.0**	345.9	584.3	29.1	18.8	1.000077
39000.0	218.4	-49.1	17.7**	339.6	582.9	26.9	19.6	1.000076
39500.0	213.4	-50.1	15.3**	333.4	581.5	26.4	20.5	1.000074
40000.0	208.5	-51.2	12.9**	327.4	580.1	27.7	21.7	1.000073
40500.0	203.8	-52.3	10.5**	321.4	578.7	28.4	22.3	1.000072
41000.0	199.1	-53.3	8.1**	315.6	577.3	28.4	22.2	1.000070
41500.0	194.6	-54.4	5.8**	309.9	575.9	27.9	21.9	1.000069
42000.0	190.1	-55.5	3.4**	304.3	574.5	26.7	21.3	1.000068
42500.0	185.6	-56.6	1.0**	298.8	573.1	25.1	20.7	1.000067
43000.0	181.4	-57.6		293.2	571.7	23.0	20.1	1.000065
43500.0	177.0	-58.7		287.5	570.3	20.7	19.6	1.000064
44000.0	172.7	-59.7		281.9	568.9	18.0	19.3	1.000063
44500.0	168.5	-60.8		276.4	567.4	15.5	18.9	1.000062
45000.0	164.4	-61.8		271.0	566.0	14.7	17.8	1.000060
45500.0	160.4	-62.9		265.7	564.6	13.9	16.8	1.000059
46000.0	156.5	-63.9		260.6	563.2	10.8	15.6	1.000058
46500.0	152.7	-65.0		255.5	561.8	7.5	14.4	1.000057
47000.0	149.0	-66.0		250.6	560.4	5.5	13.7	1.000056
47500.0	145.3	-67.1		245.8	558.9	4.1	13.2	1.000055
48000.0	141.8	-68.2		241.0	557.5	2.3	13.0	1.000054

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3925.0  
28 AUG. 70 1900 HRS MDT  
ASCENSION NO. 769

UPPER AIR DATA  
2400020769  
WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE				DIRECTION DEGREES(TN)	SPEED KNOTS	
48500.0	128.2	-69.0			235.9	556.4	0.1	13.1	1.000053
49000.0	124.8	-69.7			230.8	555.4	358.8	13.3	1.000051
49500.0	131.4	-70.4			225.8	554.4	1.8	13.9	1.000050
50000.0	128.1	-71.1			220.8	553.5	4.9	14.6	1.000049
50500.0	124.8	-71.7			215.9	552.7	11.3	14.7	1.000048
51000.0	121.7	-72.3			211.1	551.8	18.2	14.7	1.000047
51500.0	118.6	-73.0			206.3	550.9	28.3	14.4	1.000046
52000.0	115.5	-73.6			201.7	550.1	40.7	13.7	1.000045
52500.0	112.6	-72.0			195.1	552.2	53.4	13.0	1.000043
53000.0	109.8	-70.1			188.3	554.8	66.7	11.9	1.000042
53500.0	107.0	-70.2			183.6	554.8	80.0	10.8	1.000041
54000.0	104.3	-70.2			179.1	554.7	93.2	10.2	1.000040
54500.0	101.7	-70.3			174.6	554.6	106.4	9.8	1.000039
55000.0	99.1	-70.3			170.3	554.5	119.5	9.4	1.000038
55500.0	96.6	-70.2			165.9	554.7	127.8	8.8	1.000037
56000.0	94.2	-68.8			160.6	556.6	136.1	8.1	1.000036
56500.0	91.9	-67.4			155.6	558.5	140.2	7.3	1.000035
57000.0	89.6	-66.0			150.7	560.4	140.6	6.3	1.000034
57500.0	87.4	-64.6			146.0	562.3	139.7	5.9	1.000033
58000.0	85.2	-64.3			142.2	562.8	135.3	6.6	1.000032
58500.0	83.2	-64.1			138.6	563.0	131.2	7.4	1.000031
59000.0	81.1	-63.9			135.1	563.3	131.0	7.1	1.000030
59500.0	79.2	-63.7			131.7	563.5	130.7	6.9	1.000029
60000.0	77.2	-63.5			128.4	563.8	128.7	7.4	1.000029
60500.0	75.3	-63.3			125.1	564.0	126.3	7.9	1.000028
61000.0	73.5	-63.2			122.0	564.2	122.8	8.4	1.000027
61500.0	71.7	-63.0			118.9	564.5	118.2	8.6	1.000026
62000.0	70.0	-62.8			115.9	564.7	113.6	8.9	1.000026
62500.0	68.3	-62.6			113.0	565.0	111.3	10.1	1.000025
63000.0	66.6	-61.9			109.9	566.0	109.0	11.3	1.000024

STATION ALTITUDE 1985.  
 28 AUG. 70 1900 JRS MDT  
 ASCENSION NO. 769

UPPER AIR DATA  
 2400020769  
 WHITE SANDS

WSTM SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	°	DIRECTION DEGREES(TN)	SPEED KNOTS	
63500.0	65.0	-61.0			106.8	567.2		108.2	12.0	1.000024
64000.0	63.5	-60.1			103.8	568.3		108.7	12.3	1.000023
64500.0	61.9	-59.3			100.9	569.5		109.2	12.5	1.000022
65000.0	60.5	-58.4			98.1	570.6		109.3	11.9	1.000022
65500.0	59.0	-57.5			95.3	571.8		109.3	11.2	1.000021
66000.0	57.6	-57.4			93.1	571.9		107.3	11.6	1.000021
66500.0	56.3	-57.3			90.8	572.0		104.2	12.5	1.000020
67000.0	54.9	-57.3			88.7	572.1		101.2	13.5	1.000020
67500.0	53.6	-57.2			86.5	572.2		98.8	14.6	1.000019
68000.0	52.4	-57.1			84.5	572.3		96.4	15.7	1.000019
68500.0	51.1	-57.0			82.4	572.5		97.1	17.5	1.000018
69000.0	49.9	-56.9			80.5	572.6		98.5	19.4	1.000018
69500.0	48.6	-56.8			78.5	572.7		99.2	20.7	1.000017
70000.0	47.4	-56.8			76.6	572.8		98.9	21.0	1.000017
70500.0	46.5	-56.7			74.8	572.9		98.6	21.4	1.000017
71000.0	45.4	-56.6			73.0	573.0		98.5	21.9	1.000016
71500.0	44.3	-56.5			71.3	573.1		98.6	22.5	1.000016
72000.0	43.3	-56.4			69.6	573.2		98.7	23.0	1.000015
72500.0	42.2	-56.3			67.9	573.3		97.1	23.1	1.000015
73000.0	41.3	-56.3			66.3	573.4		95.1	23.1	1.000015
73500.0	40.3	-56.2			64.7	573.5		93.1	23.1	1.000014
74000.0	39.3	-56.1			63.1	573.7		91.4	23.0	1.000014
74500.0	38.4	-56.0			61.6	573.8		89.6	23.0	1.000014
75000.0	37.5	-55.9			60.1	573.9		87.9	23.0	1.000013
75500.0	36.6	-55.9			58.7	574.0		85.9	23.2	1.000013
76000.0	35.7	-55.8			57.3	574.1		83.8	23.6	1.000013
76500.0	34.9	-55.6			55.9	574.3		81.7	23.9	1.000012
77000.0	34.1	-55.0			54.5	575.1		81.8	23.8	1.000012
77500.0	33.3	-54.4			53.1	575.8		82.7	23.4	1.000012
78000.0	32.5	-53.8			51.7	576.6		83.7	23.1	1.000012

STATION ALTITUDE

28 AUG. 70

ASCENSION NO.

1900 HRS

°C

UPPER AIR DATA

2400020769

WHITE SANDS

WSTM SITE COORDINATES

488580.00 FEET E

185045.00 FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
78500.0	31.8	-53.3		50.3	577.4	84.9	22.5	1.000011
79000.0	31.0	-52.7		49.0	578.2	86.4	21.8	1.000011
79500.0	30.3	-52.1		47.8	579.0	87.9	21.1	1.000011
80000.0	29.6	-51.8		46.6	579.3	88.4	20.4	1.000010
80500.0	28.9	-51.7		45.5	579.4	88.4	19.8	1.000010
81000.0	28.3	-51.7		44.5	579.5	88.4	19.1	1.000010
81500.0	27.6	-51.6		43.4	579.5	85.8	18.6	1.000010
82000.0	27.0	-51.6		42.4	579.6	82.9	18.0	1.000009
82500.0	26.4	-51.5		41.4	579.6	80.8	17.8	1.000009
83000.0	25.7	-51.5		40.5	579.7	82.0	18.9	1.000009
83500.0	25.2	-51.5		39.5	579.8	83.1	20.0	1.000009
84000.0	24.6	-51.4		38.6	579.8	84.1	21.0	1.000009
84500.0	24.0	-51.4		37.7	579.9	85.0	22.0	1.000008
85000.0	23.5	-51.3		36.8	579.9	85.8	23.0	1.000008
85500.0	22.9	-51.3		36.0	580.0	84.3	24.2	1.000008
86000.0	22.4	-51.2		35.2	580.1	82.4	25.4	1.000008
86500.0	21.9	-51.2		34.3	580.1	80.7	26.7	1.000008
87000.0	21.4	-51.1		33.5	580.2	80.1	28.3	1.000007
87500.0	20.9	-51.0		32.8	580.3	79.4	29.8	1.000007
88000.0	20.4	-50.8		32.0	580.6	79.1	30.8	1.000007
88500.0	20.0	-50.5		31.2	581.0	79.2	31.3	1.000007
89000.0	19.5	-50.3		30.5	581.3	79.2	31.3	1.000007
89500.0	19.1	-50.1		29.8	581.6	80.7	33.1	1.000007
90000.0	18.6	-49.8		29.1	581.9	82.6	34.5	1.000006
90500.0	18.2	-49.6		28.4	582.2	84.5	35.9	1.000006
91000.0	17.8	-49.3		27.7	582.6	85.1	35.3	1.000006
91500.0	17.4	-49.1		27.1	582.9	85.7	34.7	1.000006
92000.0	17.0	-48.8		26.4	583.2	86.6	34.4	1.000006
92500.0	16.6	-48.6		25.8	583.5	88.4	34.6	1.000006
93000.0	16.3	-48.3		25.2	583.8	90.1	34.8	1.000006

XX WIND DATA MAY BE INVALID DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.

STATION ALTITUDE 28 AUG. 70  
ASCENSION NO. 70

1900 HRS MDT

UPPER AIR DATA  
2400020769  
WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
93500.0	15.5	-48.1		24.6	584.2	92.1	34.5XX	1.000005
94000.0	15.5	-47.8		24.0	584.5	94.6	33.4XX	1.000005
94500.0	15.2	-47.6		23.4	584.8	97.0	32.2XX	1.000005
95000.0	14.8	-47.3		22.9	585.1	98.8	31.3XX	1.000005
95500.0	14.5	-47.1		22.4	585.4	98.9	30.9XX	1.000005
96000.0	14.2	-46.8		21.8	585.8	98.9	30.5XX	1.000005
96500.0	13.9	-46.6		21.3	586.1	99.0	30.1XX	1.000005
97000.0	13.5	-46.3		20.8	586.4	99.0	29.7XX	1.000005
97500.0	13.2	-46.1		20.3	586.7	98.5	29.5XX	1.000005
98000.0	12.9	-45.9		19.8	587.0	97.6	29.5XX	1.000004
98500.0	12.6	-45.6		19.4	587.4	96.7	29.5XX	1.000004
99000.0	12.4	-45.4		18.9	587.7	95.8	29.5XX	1.000004
99500.0	12.1	-45.1		18.5	588.0	94.9	29.6XX	1.000004
100000.0	11.8	-44.9		18.0	588.3	93.6	29.8XX	1.000004
100500.0	11.5	-44.6		17.6	588.6	92.3	30.0XX	1.000004
101000.0	11.3	-44.4		17.2	589.0	90.9	30.3XX	1.000004
101500.0	11.0	-44.1		16.8	589.3	89.8	30.6	1.000004
102000.0	10.8	-43.9		16.4	589.6	88.7	30.9	1.000004
102500.0	10.5	-43.6		16.0	589.9	87.6	31.2	1.000004
103000.0	10.3	-43.4		15.6	590.2	87.5	31.3	1.000003
103500.0	10.1	-43.1		15.3	590.5	88.1	31.2	1.000003
104000.0	9.8	-42.9		14.9	590.9	88.6	31.1	1.000003
104500.0	9.6	-42.6		14.5	591.2	88.2	31.3	1.000003
105000.0	9.4	-42.4		14.2	591.5	86.3	32.0	1.000003
105500.0	9.2	-42.1		13.9	591.9	84.5	32.7	1.000003
106000.0	9.0	-41.7		13.6	592.3	83.3	33.4	1.000003
106500.0	8.8	-41.4		13.2	592.7	84.0	34.4	1.000003
107000.0	8.6	-41.1		12.9	593.1	84.6	35.3	1.000003
107500.0	8.4	-40.8		12.6	593.5	85.2	36.3	1.000003
108000.0	8.2	-40.5		12.3	593.9	84.3	36.0	1.000003

XX WIND DATA MAY BE INVALID DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.

# UPPER AIR DATA

2400020709

WHITE SANDS

WSTM SITE COORDINATES  
485580.00 FEET E  
185045.00 FEET N

STATION ALTITUDE  
28 AUG 70  
1900 HRS MDT

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SOUND SPEED KNOTS	WIND DATA		INDEX OF REFRACTION
					DIRECTION DEGREES (TN)	SPEED KNOTS	
108500.0	8.1	-40.2	12.1	594.3	83.4	35.8	1.0000003
109000.0	7.9	-39.9	11.8	594.7	82.4	35.5	1.0000003
109500.0	7.7	-39.6	11.5	595.1			1.0000003
110000.0	7.5	-39.3	11.2	595.5			1.0000002
110500.0	7.4	-38.9	11.0	595.9			1.0000002
111000.0	7.2	-38.6	10.7	596.3			1.0000002
111500.0	7.1	-38.3	10.5	596.7			1.0000002
112000.0	6.9	-38.0	10.2	597.1			1.0000002

STATION ALTITUDE

28 AUG. 70

ASCENSION NO.

MANDATORY LEVELS

2400020769

WHITE SANDS

1900 HRS

MDT

WSTM SITE COORDINATES

488580.00 FEET E

185045.00 FEET N

TABLE VIII.

PRESSURE		TEMPERATURE	REL. HUM.	WIND DATA	
MILLIBARS	FEET	AIR DEGREES	DEWPOINT PERCENT	DIRECTION DEGREES(TN)	SPEED KNOTS
850.0	4907.	29.3	1.6	170.0	4.6XX
800.0	6660.	24.4	-1.0	151.0	5.7XX
750.0	8494.	19.2	-4.0	131.1	6.8XX
700.0	10418.	13.7	-7.5	110.2	8.0XX
650.0	12443.	7.7	-11.4	88.1	9.2XX
600.0	14592.	4.8	-20.5	65.5	10.4
550.0	16902.	1.1	-23.5	109.5	4.6
500.0	19397.	-3.1	-26.7	154.2	2.6
450.0	22102.	-9.2	-30.1	120.8	6.5
400.0	25052.	-16.1	-34.4	87.2	10.3
350.0	28302.	-23.8	-39.6	52.3	5.7
300.0	31929.	-33.0	-44.7	30.6	11.5
250.0	36045.	-42.8	-53.2	31.8	14.4
200.0	40874.	-53.1	-71.8	28.4	22.2
175.0	43658.	-59.1		19.3	19.5
150.0	46780.	-65.7		5.8	13.8
125.0	50356.	-71.7		11.0	14.7
100.0	54680.	-70.3		115.0	9.6
80.0	59110.	-63.8		130.8	7.0
70.0	61803.	-62.8		113.7	8.9
60.0	64949.	-58.1		109.3	11.7
50.0	68731.	-56.9		98.4	19.3
40.0	73376.	-56.2		92.1	23.1
30.0	79414.	-51.8		88.4	20.8
25.0	83295.	-51.4		8.4	20.3
20.0	88055.	-50.6		79.2	31.3
15.0	94252.	-47.5		97.9	31.8XX
10.0	103132.	-43.1		88.3	31.2
7.0	111099.	-38.2			

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

XX WIND DATA MAY BE INVALID DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.



STATION ALTITUDE 2200 HRS MDT  
 28 AUG. 70  
 ASCENSION NO. 770

SIGNIFICANT LEVEL DATA  
 2400020770  
 WHITE SANDS

WSTM SITE COORDINATES  
 488580.00 FEET E  
 165045.00 FEET N

TABLE IX

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE MSL FEET	TEMPERATURE		REL. HUM. PERCENT
		AIR DEGREES	DEWPOINT CENTIGRADE	
878.5	3989.0	21.4	4.5	33.0
869.0	4302.0	28.5	8.8	29.0
864.0	4470.2	28.5	6.0	24.0
775.0	7592.9	20.7	-3.7	19.0
623.0	13594.8	3.4	-9.6	38.0
616.0	13897.2	5.5	-12.5	26.0
608.0	14248.0	5.2	-19.4	15.0
554.0	16727.2	1.9	-22.9	14.0
429.0	23330.6	-12.1	-28.2	25.0
317.0	30687.5	-29.6	-42.1	29.0
294.0	32438.7	-34.5	-42.2	46.0
288.0	32911.8	-36.0	-42.1	54.0
275.0	33963.1	-38.3	-47.0	40.0
255.0	35658.6	-42.4	-50.6	41.0
209.0	39992.4	-52.2		
150.0	46845.3	-65.9		
114.0	52236.7	-73.5		
107.0	53464.2	-71.8		
101.0	54587.7	-71.5		
91.0	56636.4	-68.1		
85.0	57986.6	-68.6		
80.0	59196.4	-64.8		
76.0	60228.8	-65.1		
67.0	62790.9	-60.7		
59.0	65421.2	-57.8		
54.0	67260.8	-59.0		
42.0	72521.2	-54.6		
34.0	76979.1	-55.8		
27.0	81863.5	-52.9		
23.0	85274.9	-54.2		

STATION ALTITUDE 2585  
28 AUG. 70 2200 HRS MDT  
ASCENSION NO. 71

SIGNIFICANT LEVEL DATA  
2400020770  
WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE IX (Cont)

PRESSURE GEOMETRIC ALTITUDE		TEMPERATURE		REL. HUM. PERCENT
MILLIBARS	MSL FEET	AIR	DEWPOINT DEGREES CENTIGRADE	
16.0	93118.0		-46.1	
11.5	100425.5		-43.9	
9.8	104023.5		-38.9	
6.3	114044.1		-40.2	
4.7	120759.4		-34.4	
4.4	122290.0		-34.6	

STATIC ALTITUDE 2200 HRS MDT  
28 AUG. 70  
ASCENSION NO.

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE X

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
3989.0	878.5	21.4	4.5	33.0	1035.4	669.5		150.0	4.1	1.000267
4000.0	878.2	21.6	4.7	32.9	1034.1	669.8		150.1	4.1	1.000268
4500.0	863.1	28.4	5.9	24.0	993.1	677.6		153.5	5.3	1.000260
5000.0	848.2	27.2	4.4	23.2	980.4	676.0		156.9	6.6	1.000254
5500.0	833.6	25.9	2.8	22.4	967.8	674.5		160.4	7.8	1.000247
6000.0	819.2	24.7	1.3	21.6	955.4	673.0		163.8	9.1	1.000241
6500.0	805.1	23.4	-0.3	20.7	943.1	671.5		162.1	9.9	1.000236
7000.0	791.2	22.2	-1.9	19.9	931.0	670.0		159.3	10.5	1.000231
7500.0	777.5	20.9	-3.5	19.1	919.0	668.5		160.3	10.6	1.000226
8000.0	763.6	19.5	-3.8	20.3	907.0	666.9		160.2	10.3	1.000222
8500.0	749.8	18.1	-4.0	21.9	895.0	665.3		158.9	9.5	1.000220
9000.0	736.3	16.6	-4.3	23.5	883.3	663.6		154.1	8.6	1.000217
9500.0	723.1	15.2	-4.7	25.0	871.7	661.9		146.0	7.9	1.000214
10000.0	710.0	13.8	-5.1	26.6	860.3	660.3		131.7	7.4	1.000211
10500.0	697.2	12.3	-5.6	28.2	849.1	658.6		120.2	7.9	1.000208
11000.0	684.7	10.9	-6.1	29.8	838.1	656.9		109.9	8.9	1.000205
11500.0	672.3	9.4	-6.7	31.4	827.2	655.2		99.8	10.3	1.000202
12000.0	660.2	8.0	-7.3	33.0	816.5	653.5		91.3	11.6	1.000199
12500.0	648.3	6.6	-8.0	34.5	806.0	651.8		84.2	12.7	1.000196
13000.0	636.6	5.1	-8.7	36.1	795.6	650.1		75.8	11.7	1.000193
13500.0	625.2	3.7	-9.5	37.7	785.4	648.4		70.9	10.7	1.000190
14000.0	613.6	5.4	-14.2	22.8	766.6	650.3		70.0	9.8	1.000181
14500.0	602.3	4.9	-19.7	14.9	754.2	649.5		76.1	9.0	1.000174
15000.0	591.1	4.2	-20.4	14.7	742.0	648.7		83.2	8.6	1.000171
15500.0	580.1	3.5	-21.1	14.5	730.0	647.9		90.8	9.4	1.000168
16000.0	569.3	2.9	-21.8	14.3	718.1	647.1		94.1	9.6	1.000165
16500.0	558.7	2.2	-22.5	14.1	706.5	646.3		95.3	9.4	1.000162
17000.0	548.2	1.3	-23.0	14.5	695.4	645.3		93.0	8.3	1.000160
17500.0	537.7	0.3	-23.2	15.3	684.7	644.1		91.4	7.3	1.000157
18000.0	527.4	-0.8	-23.5	16.1	674.2	642.8		91.8	6.4	1.000155

STATION ALTITUDE 24000.00 MSL  
 28 AUG. 70  
 ASCENSION NO. 77  
 2200 HRS MDT  
 UPPER AIR DATA  
 2400020770  
 WHITE SANDS  
 WSTM SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	DEWPOINT CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
18500.0	517.2	-1.9	-23.8	17.0	663.9	641.6	88.1	5.4	1.000152
19000.0	507.3	-2.9	-24.1	17.8	653.7	640.3	82.0	4.3	1.000150
19500.0	497.6	-4.0	-24.5	18.6	643.7	639.0	78.7	3.9	1.000148
20000.0	488.1	-5.0	-24.9	19.5	633.8	637.8	85.5	3.6	1.000145
20500.0	478.7	-6.1	-25.3	20.3	624.2	636.5	103.2	3.4	1.000143
21000.0	469.5	-7.2	-25.8	21.1	614.6	635.2	122.6	3.8	1.000141
21500.0	460.5	-8.2	-26.3	22.0	605.3	634.0	135.4	4.5	1.000139
22000.0	451.7	-9.3	-26.8	22.8	596.1	632.7	137.4	5.6	1.000136
22500.0	443.0	-10.3	-27.3	23.6	587.0	631.4	127.2	5.9	1.000134
23000.0	434.5	-11.4	-27.8	24.4	578.1	630.1	113.6	6.1	1.000132
23500.0	426.0	-12.5	-28.5	25.1	569.2	628.8	101.6	7.5	1.000130
24000.0	417.4	-13.7	-29.4	25.4	560.2	627.4	95.0	8.1	1.000128
24500.0	408.9	-14.9	-30.4	25.6	551.3	625.9	92.7	8.2	1.000126
25000.0	400.5	-16.1	-31.3	25.9	542.6	624.4	90.1	7.7	1.000123
25500.0	392.4	-17.3	-32.2	26.2	534.1	623.0	85.7	6.9	1.000121
26000.0	384.4	-18.4	-33.2	26.5	525.6	621.5	79.5	5.8	1.000119
26500.0	376.6	-19.6	-34.1	26.7	517.4	620.1	70.0	5.9	1.000117
27000.0	368.9	-20.8	-35.0	27.0	509.2	618.6	62.3	6.3	1.000115
27500.0	361.4	-22.0	-36.0	27.3	501.3	617.1	59.9	7.2	1.000113
28000.0	354.0	-23.2	-36.9	27.5	493.4	615.7	58.4	7.7	1.000111
28500.0	346.8	-24.4	-37.9	27.8	485.7	614.2	57.5	7.8	1.000110
29000.0	339.8	-25.6	-38.8	28.1	478.1	612.7	45.6	7.8	1.000108
29500.0	332.9	-26.8	-39.8	28.4	470.6	611.2	33.8	7.9	1.000106
30000.0	326.1	-28.0	-40.8	28.6	463.3	609.8	28.9	8.4	1.000104
30500.0	319.5	-29.2	-41.7	28.9	456.1	608.3	22.5	9.3	1.000103
31000.0	312.8	-30.5	-41.9	32.0	449.0	606.6	20.8	10.4	1.000101
31500.0	306.1	-31.5	-41.9	36.9	442.0	604.9	24.5	11.7	1.000099
32000.0	299.6	-33.3	-42.0	41.7	435.1	603.1	29.0	12.9	1.000098
32500.0	293.2	-34.7	-42.2	47.0	428.3	601.3	30.6	14.0	1.000096
33000.0	286.9	-36.2	-42.5	52.8	421.7	599.4	32.1	15.0	1.000095

STATION ALTITUDE 28 AUG. 70 2200 HRS MDT  
 JPPER AIR DATA 2400020770  
 WHITE SANDS  
 WSTM SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE X (Cont)

GEOMETRIC ALTITUDE	PRESSURE	AIR TEMPERATURE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
MSL FEET	MILLIBARS	DEGREES CENTIGRADE						
33500.0	280.7	-37.3	46.2	414.5	598.0	33.2	15.6	1.000093
34000.0	274.5	-38.4	40.0	407.4	596.6	34.4	16.2	1.000091
34500.0	268.5	-39.6	40.3	400.5	595.1	36.1	16.8	1.000090
35000.0	262.6	-40.8	40.6	393.7	593.6	37.4	17.4	1.000088
35500.0	256.8	-42.0	40.9	387.1	592.0	37.8	17.7	1.000087
36000.0	251.0	-43.2	37.8**	380.3	590.5	38.3	18.3	1.000085
36500.0	245.3	-44.3	33.0**	373.5	589.1	38.9	19.4	1.000083
37000.0	239.8	-45.4	28.3**	366.8	587.6	37.1	20.1	1.000082
37500.0	234.3	-46.6	23.6**	360.3	586.1	34.4	20.7	1.000080
38000.0	229.0	-47.7	18.8**	353.9	584.7	31.7	22.3	1.000079
38500.0	223.8	-48.8	14.1**	347.6	583.2	29.6	24.0	1.000077
39000.0	218.7	-50.0	9.4**	341.5	581.7	29.3	26.0	1.000076
39500.0	213.8	-51.1	4.7**	335.4	580.2	29.8	27.3	1.000075
40000.0	208.9	-52.2		329.5	578.8	31.3	27.6	1.000073
40500.0	203.9	-53.2		323.1	577.5	32.5	26.9	1.000072
41000.0	199.1	-54.2		316.8	576.1	33.5	25.7	1.000071
41500.0	194.3	-55.2		310.6	574.8	33.5	23.6	1.000069
42000.0	189.6	-56.2		304.6	573.5	33.4	21.7	1.000068
42500.0	185.1	-57.2		298.7	572.2	33.5	21.4	1.000067
43000.0	180.7	-58.2		292.9	570.9	33.5	21.2	1.000065
43500.0	176.4	-59.2		287.2	569.5	33.3	21.1	1.000064
44000.0	172.1	-60.2		281.7	568.2	32.4	20.9	1.000063
44500.0	168.0	-61.2		276.2	566.9	30.2	20.6	1.000062
45000.0	164.0	-62.2		270.9	565.5	27.2	20.0	1.000060
45500.0	160.1	-63.2		265.7	564.2	22.6	18.9	1.000059
46000.0	156.3	-64.2		260.6	562.8	17.9	18.1	1.000058
46500.0	152.5	-65.2		255.6	561.5	13.0	17.7	1.000057
47000.0	148.8	-66.1		250.5	560.3	9.2	17.3	1.000056
47500.0	145.1	-66.8		245.0	559.3	7.9	16.9	1.000055
48000.0	141.4	-67.5		239.7	558.4	9.4	16.3	1.000053

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 2200 HRS MDT  
 28 AUG. 70  
 ASCENSION NO. 7

UPPER AIR DATA  
 2400020770  
 WHITE SANDS

WSTM SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPCINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
48500.0	137.9	-68.2			234.4	557.4		15.4	15.5	1.000052
49000.0	134.4	-68.9			229.3	556.4		21.6	14.7	1.000051
49500.0	131.0	-69.6			224.3	555.5		28.1	13.8	1.000050
50000.0	127.7	-70.3			219.5	554.5		34.6	12.9	1.000049
50500.0	124.5	-71.1			214.7	553.5		41.4	12.0	1.000048
51000.0	121.4	-71.8			210.0	552.6		48.2	11.2	1.000047
51500.0	118.4	-72.5			205.5	551.6		62.3	10.4	1.000046
52000.0	115.4	-73.2			201.0	550.6		78.3	9.6	1.000045
52500.0	112.5	-73.1			195.9	550.7		92.8	9.4	1.000044
53000.0	109.6	-72.4			190.2	551.6		106.0	9.6	1.000042
53500.0	106.8	-71.8			184.8	552.5		118.5	10.1	1.000041
54000.0	104.1	-71.7			180.0	552.7		129.3	11.3	1.000040
54500.0	101.5	-71.5			175.3	552.9		140.0	12.5	1.000039
55000.0	98.9	-70.8			170.3	553.9		148.3	10.8	1.000038
55500.0	96.4	-70.0			165.4	555.0		156.6	9.2	1.000037
56000.0	94.0	-69.2			160.5	556.1		163.7	8.0	1.000036
56500.0	91.6	-68.3			155.9	557.3		170.1	7.1	1.000035
57000.0	89.3	-68.2			151.9	557.4		171.6	6.2	1.000034
57500.0	87.1	-68.4			148.3	557.1		155.2	4.9	1.000033
58000.0	84.9	-68.6			144.7	557.0		138.8	3.7	1.000032
58500.0	82.8	-67.0			140.0	559.1		125.8	3.8	1.000031
59000.0	80.8	-65.4			135.5	561.2		114.1	4.4	1.000030
59500.0	78.8	-64.9			131.8	561.9		104.1	5.2	1.000029
60000.0	76.9	-65.0			128.7	561.7		102.4	6.8	1.000029
60500.0	75.0	-64.6			125.3	562.3		100.7	8.3	1.000028
61000.0	73.2	-63.8			121.8	563.4		103.0	9.3	1.000027
61500.0	71.4	-62.9			118.3	564.6		108.3	9.9	1.000026
62000.0	69.7	-62.1			115.0	565.7		113.6	10.5	1.000026
62500.0	68.0	-61.2			111.7	566.9		113.8	10.8	1.000025
63000.0	66.3	-60.5			108.7	567.9		114.0	11.2	1.000024

ASST. DIR. - 11-3356

2200 HRS MDT

105045.00 FULTON  
105046.00 FULTON

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	AIR TEMPERATURE DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF		WIND DATA DIRECTION DEGREES (TN)	SPEED KNOTS	INDEX OF REFRACTION
					SOUND KNOTS	SOUND KNOTS			
63500.0	64.7	-59.9		105.8	568.6		113.7	11.5	1.0000024
64000.0	63.2	-59.4		103.0	569.3		112.9	11.7	1.0000023
64500.0	61.7	-58.8		100.5	570.1		112.0	12.0	1.0000022
65000.0	60.2	-58.3		97.6	570.8		105.5	11.8	1.0000022
65500.0	58.8	-57.9		95.1	571.3		98.9	11.7	1.0000021
66000.0	57.4	-58.2		93.0	572.9		93.6	12.2	1.0000021
66500.0	56.0	-58.5		90.9	570.5		90.2	13.7	1.0000020
67000.0	54.7	-58.8		88.9	570.0		86.7	15.3	1.0000020
67500.0	53.4	-58.8		86.8	570.1		84.2	16.7	1.0000019
68000.0	52.1	-58.4		84.6	570.6		83.0	17.8	1.0000019
68500.0	50.9	-58.0		82.4	571.2		81.8	19.0	1.0000018
69000.0	49.7	-57.5		80.3	571.7		81.0	20.0	1.0000018
69500.0	48.5	-57.1		78.3	572.3		82.7	20.6	1.0000017
70000.0	47.4	-56.7		76.3	572.9		84.3	21.1	1.0000017
70500.0	46.3	-56.3		74.3	573.4		86.0	21.7	1.0000017
71000.0	45.2	-55.9		72.4	574.0		88.0	21.8	1.0000016
71500.0	44.1	-55.5		70.6	574.5		90.0	21.9	1.0000016
72000.0	43.1	-55.0		68.8	575.1		92.1	22.0	1.0000015
72500.0	42.0	-54.6		67.0	575.6		94.4	21.8	1.0000015
73000.0	41.1	-54.7		65.5	575.5		96.9	21.5	1.0000015
73500.0	40.1	-54.9		64.0	575.3		99.3	21.2	1.0000014
74000.0	39.2	-55.0		62.5	575.1		100.7	20.9	1.0000014
74500.0	38.2	-55.1		61.1	574.9		102.1	20.7	1.0000014
75000.0	37.3	-55.3		59.7	574.8		102.2	20.0	1.0000013
75500.0	36.5	-55.4		58.4	574.6		101.8	19.1	1.0000013
76000.0	35.6	-55.5		57.0	574.4		101.6	18.9	1.0000013
76500.0	34.8	-55.7		55.7	574.2		101.7	19.6	1.0000012
77000.0	34.0	-55.8		54.4	574.1		101.8	20.3	1.0000012
77500.0	33.2	-55.5		53.1	574.5		101.2	20.8	1.0000012
78000.0	32.4	-55.2		51.8	574.9		100.6	21.3	1.0000012

# UPPER AIR DATA

STATION ALTITUDE 3985.00  
 28 AUG. 70 2200 HRS MDT  
 ASCENSION NO. 110

2400020770  
 WHITE SANDS

WSTM SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS			
78500.0	31.6	-54.9			50.5	575.2		100.1	21.6	1.000011
79000.0	30.9	-54.6			49.3	575.6		99.7	21.9	1.000011
79500.0	30.2	-54.3			48.1	576.0		98.9	22.1	1.000011
80000.0	29.5	-54.0			46.9	576.4		94.6	21.3	1.000010
80500.0	28.8	-53.7			45.7	576.8		90.4	20.4	1.000010
81000.0	28.1	-53.4			44.6	577.2		87.0	20.4	1.000010
81500.0	27.5	-53.1			43.5	577.6		84.5	21.2	1.000010
82000.0	26.8	-53.0			42.4	577.8		82.1	22.0	1.000009
82500.0	26.2	-53.1			41.5	577.6		80.8	23.1	1.000009
83000.0	25.6	-53.3			40.6	577.3		79.9	24.2	1.000009
83500.0	25.0	-53.5			39.7	577.1		79.2	25.5	1.000009
84000.0	24.4	-53.7			38.8	576.8		79.9	27.4	1.000009
84500.0	23.9	-53.9			37.9	576.6		80.6	29.4	1.000008
85000.0	23.3	-54.1			37.1	576.3		80.9	30.9	1.000008
85500.0	22.8	-54.0			36.2	576.5		80.8	32.0	1.000008
86000.0	22.2	-53.5			35.3	577.1		80.8	33.1	1.000008
86500.0	21.7	-52.9			34.4	577.8		80.7	34.5	1.000008
87000.0	21.2	-52.4			33.5	578.5		80.6	35.8	1.000007
87500.0	20.7	-51.9			32.7	579.2		80.7	37.0	1.000007
88000.0	20.3	-51.4			31.9	579.9		81.8	37.2	1.000007
88500.0	19.8	-50.9			31.1	580.5		82.9	37.5	1.000007
89000.0	19.4	-50.4			30.3	581.2		84.1	37.8	1.000007
89500.0	18.9	-49.8			29.5	581.9		85.8	38.2	1.000007
90000.0	18.5	-49.3			28.8	582.5		87.4	38.7	1.000006
90500.0	18.1	-48.8			28.0	583.2		88.8	38.7	1.000006
91000.0	17.6	-48.3			27.3	583.9		89.7	38.0	1.000006
91500.0	17.2	-47.8			26.7	584.6		90.7	37.3	1.000006
92000.0	16.8	-47.3			26.0	585.2		91.7	37.0	1.000006
92500.0	16.5	-46.7			25.3	585.9		92.8	37.0	1.000006
93000.0	16.1	-46.2			24.7	586.6		93.9	37.0	1.000005



UPPER AIR DATA  
2400020770  
WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

STATION ALTITUDE  
28 AUG. 70  
ASCENSION NC.

2200 HRS NDT

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
93500.0	15.7	-46.0			24.1	586.9		94.6	36.4	1.000005
94000.0	15.4	-45.8			23.6	587.1		95.1	35.4	1.000005
94500.0	15.0	-45.7			23.0	587.3		95.5	34.3	1.000005
95000.0	14.7	-45.5			22.5	587.5		96.3	33.9	1.000005
95500.0	14.4	-45.4			22.0	587.6		97.4	33.9	1.000005
96000.0	14.0	-45.2			21.5	587.8		98.5	33.9	1.000005
96500.0	13.7	-45.1			21.0	588.0		98.6	33.6	1.000005
97000.0	13.4	-44.9			20.5	588.2		97.8	33.0	1.000005
97500.0	13.1	-44.8			20.0	588.4		97.1	32.4	1.000004
98000.0	12.8	-44.6			19.6	588.6		95.9	32.3	1.000004
98500.0	12.5	-44.5			19.1	588.8		94.4	32.7	1.000004
99000.0	12.3	-44.3			18.7	589.0		92.9	33.0	1.000004
99500.0	12.0	-44.2			18.2	589.2		91.5	33.0	1.000004
100000.0	11.7	-44.0			17.8	589.4		90.3	32.8	1.000004
100500.0	11.5	-43.8			17.4	589.7		89.0	32.5	1.000004
101000.0	11.2	-43.1			17.0	590.6		87.9	32.1	1.000004
101500.0	11.0	-42.4			16.6	591.5		87.0	31.5	1.000004
102000.0	10.7	-41.7			16.1	592.4		86.1	30.9	1.000004
102500.0	10.5	-41.0			15.7	593.3		86.3	31.5	1.000004
103000.0	10.3	-40.3			15.3	594.1		87.4	33.0	1.000003
103500.0	10.0	-39.6			15.0	595.0		88.4	34.4	1.000003
104000.0	9.8	-38.9			14.6	595.9		89.5	35.7	1.000003
104500.0	9.6	-39.0			14.3	595.9		90.6	36.9	1.000003
105000.0	9.4	-39.0			14.0	595.8		91.8	38.0	1.000003
105500.0	9.2	-39.1			13.7	595.7		92.9	39.1	1.000003
106000.0	9.0	-39.2			13.4	595.6		93.9	40.1	1.000003
106500.0	8.8	-39.2			13.1	595.5		94.9	41.1	1.000003
107000.0	8.6	-39.3			12.8	595.5		95.9	42.1	1.000003
107500.0	8.4	-39.4			12.5	595.4		96.4	42.5	1.000003
108000.0	8.2	-39.4			12.3	595.3		95.5	40.8	1.000003

STATION ALTITUDE 5935.00 FT 11 MSL  
28 AUG. 70 2200 HRS MDT  
ASCENSION NO. 11

UPPER AIR DATA  
2400020770  
WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF		WIND DATA DIRECTION DEGREES (TN)	SPEED KNOTS	INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			SCUND KNOTS				
106500.0	8.0	-39.5			12.0	595.2		94.5	39.0	1.000003
109000.0	7.9	-39.5			11.7	595.1		93.5	37.3	1.000003
109500.0	7.7	-39.6			11.5	595.0		92.4	36.0	1.000003
110000.0	7.5	-39.7			11.2	595.0		91.1	35.1	1.000002
110500.0	7.4	-39.7			11.0	594.9		89.7	34.3	1.000002
111000.0	7.2	-39.8			10.8	594.8		88.4	33.4	1.000002
111500.0	7.0	-39.9			10.5	594.7		88.2	32.9	1.000002
112000.0	6.9	-39.9			10.3	594.6		88.5	32.4	1.000002
112500.0	6.7	-40.0			10.1	594.6		88.8	32.0	1.000002
113000.0	6.6	-40.1			9.9	594.5		89.2	31.5	1.000002
113500.0	6.5	-40.1			9.6	594.4		91.1	32.8	1.000002
114000.0	6.3	-40.2			9.4	594.3		93.1	34.0	1.000002
114500.0	6.2	-39.8			9.2	594.8		95.1	35.3	1.000002
115000.0	6.0	-39.4			9.0	595.3		97.0	36.6	1.000002
115500.0	5.9	-38.9			8.8	595.9		98.7	37.9	1.000002
116000.0	5.8	-38.5			8.6	596.4		100.4	39.2	1.000002
116500.0	5.7	-38.1			8.4	597.0		102.1	40.5	1.000002
117000.0	5.5	-37.6			8.2	597.5		102.6	41.0	1.000002
117500.0	5.4	-37.2			8.0	598.1		101.3	40.3	1.000002
118000.0	5.3	-36.8			7.8	598.6		100.0	39.7	1.000002
118500.0	5.2	-36.4			7.6	599.2		98.8	39.1	1.000002
119000.0	5.1	-35.9			7.5	599.7				1.000002
119500.0	5.0	-35.5			7.3	600.3				1.000002
120000.0	4.9	-35.1			7.1	600.8				1.000002
120500.0	4.8	-34.6			6.9	601.4				1.000002
121000.0	4.7	-34.4			6.8	601.6				1.000002
121500.0	4.6	-34.5			6.6	601.5				1.000001
122000.0	4.5	-34.6			6.5	601.4				1.000001

STATION ALTITUDE  
28 AUG. 70  
ASCENSION NO.

2200 HRS NDT

PARALLELITY LEVEL  
240000770  
WHILE SUND

STATION COORDINATES  
48°58'00" FEET E  
18°50'45" FEET N

TABLE XI

PRESSURE MILLIBARS	EQUENTIAL FEET	AIR TEMPERATURE DEGREES CENTIGRADE	REL. HUMIDITY PERCENT	WIND DATA	
				WIND DIRECTION DEGREES (TN)	WIND SPEED KNOTS
850.0	4944.	27.3	23.	156.6	6.5
800.0	6687.	23.0	20.	160.9	10.1
750.0	8513.	18.1	22.	158.8	9.5
700.0	10431.	12.6	28.	121.5	7.8
650.0	12449.	6.8	44.	84.8	12.6
600.0	14592.	4.7	15.	77.5	8.8
550.0	16904.	1.5	14.	93.3	8.5
500.0	19397.	-3.7	18.	79.3	4.0
450.0	22098.	-9.5	23.	137.6	5.8
400.0	25046.	-16.1	26.	89.7	7.6
350.0	28296.	-23.9	28.	57.8	7.7
300.0	31922.	-33.2	41.	28.9	12.9
250.0	36034.	-43.4	37.	38.4	18.5
200.0	40844.	-54.0	**	33.4	25.9
175.0	43621.	-59.5		33.1	21.0
150.0	46738.	-65.9		9.6	17.5
125.0	50325.	-70.9		40.7	12.1
100.0	54635.	-71.2		144.6	11.6
80.0	59025.	-64.8		109.5	4.7
70.0	61707.	-62.2		112.4	10.4
60.0	64864.	-58.2		104.7	11.8
50.0	68628.	-57.7		80.9	19.8
40.0	73288.	-54.9		99.4	21.2
30.0	79314.	-54.2		97.9	21.9
25.0	83163.	-53.5		79.2	25.4
20.0	87882.	-51.1		82.3	37.4
15.0	94107.	-45.7		95.5	34.2
10.0	103047.	-39.5		88.5	34.6
7.0	111059.	-39.9		88.3	32.7
5.0	118644.	-35.6			

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

RELEASE TIME (MDT)		SECOND-STAGE IMPACT DISPLACEMENT IN MILES DUE TO WIND								AZI- MUTH (DE - GREES)	THEORETICAL IMPACT FROM LAUNCHER (IN MILES)		
		TOWER 9-216 FT		PIBAL 216-4270 FT		RAWIN 4270-53200 FT		TOTAL					
		RAWIN- SONDE	PIBAL	N-S	E-W	N-S	E-W	N-S	E-W		N-S	E-W	RANGE
1900	2000	4.5S	0.9E	7.8S	4.0E	3.4N	1.8E	8.9S	6.8E	004.3	66.8	66.6N	5.0E
1900	2030	2.8S	0.3E	8.9S	4.5E	3.4N	1.8E	8.3S	6.6E	004.1	67.4	67.2N	4.8E
1900	2100	1.9S	1.7W	8.2S	1.0W	3.4N	1.8E	6.7S	0.9W	359.2	68.8	68.8N	0.9W
1900	2110	3.1S	0.7W	8.4S	0.5W	3.4N	1.8E	8.1S	0.6E	359.0	67.4	67.4N	1.2W
1900	2120	3.6S	0.5E	7.8S	0.5W	3.4N	1.8E	8.0S	1.8E	360.0	67.5	67.5N	0.0E-W
1900	2130	1.7S	0.5W	7.3S	0.8W	3.4N	1.8E	5.6S	1.5E	359.8	69.9	69.9N	0.3W
1900	2140	2.2S	0.9W	6.7S	2.3W	3.4N	1.8E	5.5S	1.4W	358.4	70.1	70.0N	3.2W
1900	2150	1.4S	0.6W	5.5S	1.8W	3.4N	1.8E	3.5S	0.6W	358.1	72.0	72.0N	2.4W
1900	2200	2.0S	0.0	5.2S	0.4W	3.4N	1.8E	3.8S	1.4E	358.4	71.8	71.7N	3.2W
2200	2200	2.0S	0.0	5.2S	0.4W	3.7N	2.6E	3.5S	2.2E	000.3	72.0	72.0N	0.4E

TABLE XII. IMPACT PREDICTION DATA  
NIKE-HYDAC STV 96

	AZIMUTH (DE- GREES)	RANGE	N-S	E-W
LAUNCHER SETTING (ELEVATION 82.7 DEGREES QE)	001.0	75.5	75.5	0.4E
NO WIND IMPACT	358.6	75.5	75.5N	1.8W
PREDICTED SECOND-STAGE IMPACT	357.0	70.1	70.0N	3.7W
SECOND-STAGE IMPACT, RADAR TRACK	354.1	70.1	69.7N	7.2W
PREDICTED BOOSTER IMPACT	358.0	1.4	1.4N	0.1W
ACTUAL BOOSTER IMPACT	354.2	1.6	0.2W	1.6N

TABLE XII. IMPACT PREDICTION DATA (CONT)  
NIKE-HYDAC STV 96

UNCLASSIFIED

Security Classification

## DOCUMENT CONTROL DATA - R &amp; D

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13. ABSTRACT  Meteorological data gathered for the launching of Nike-Hydac STV 96 are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.			

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